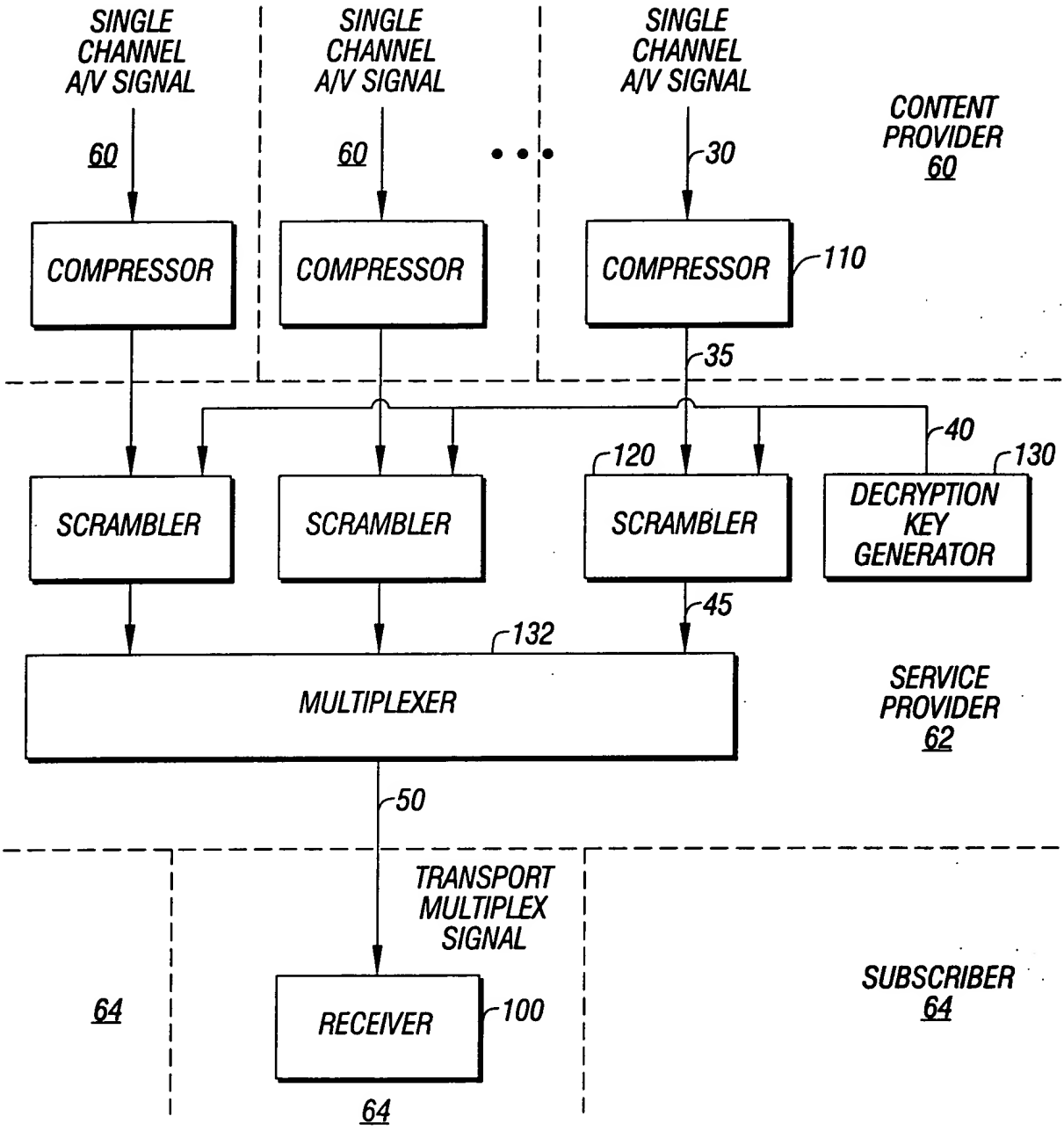
SINGLE CHANNEL A/V SIGNAL
60
SINGLE CHANNEL A/V SIGNAL
60
SINGLE CHANNEL A/V SIGNAL
30
CONTENT PROVIDER 60
COMPRESSOR
COMPRESSOR
COMPRESSOR
110
35
40
120
130
SCRAMBLER
SCRAMBLER
SCRAMBLER
DECRYPTION KEY GENERATOR
45
132
MULTIPLEXER
SERVICE PROVIDER 62
50
TRANSPORT MULTIPLEX SIGNAL
64
RECEIVER
100
64
SUBSCRIBER 64

FIGURE 1

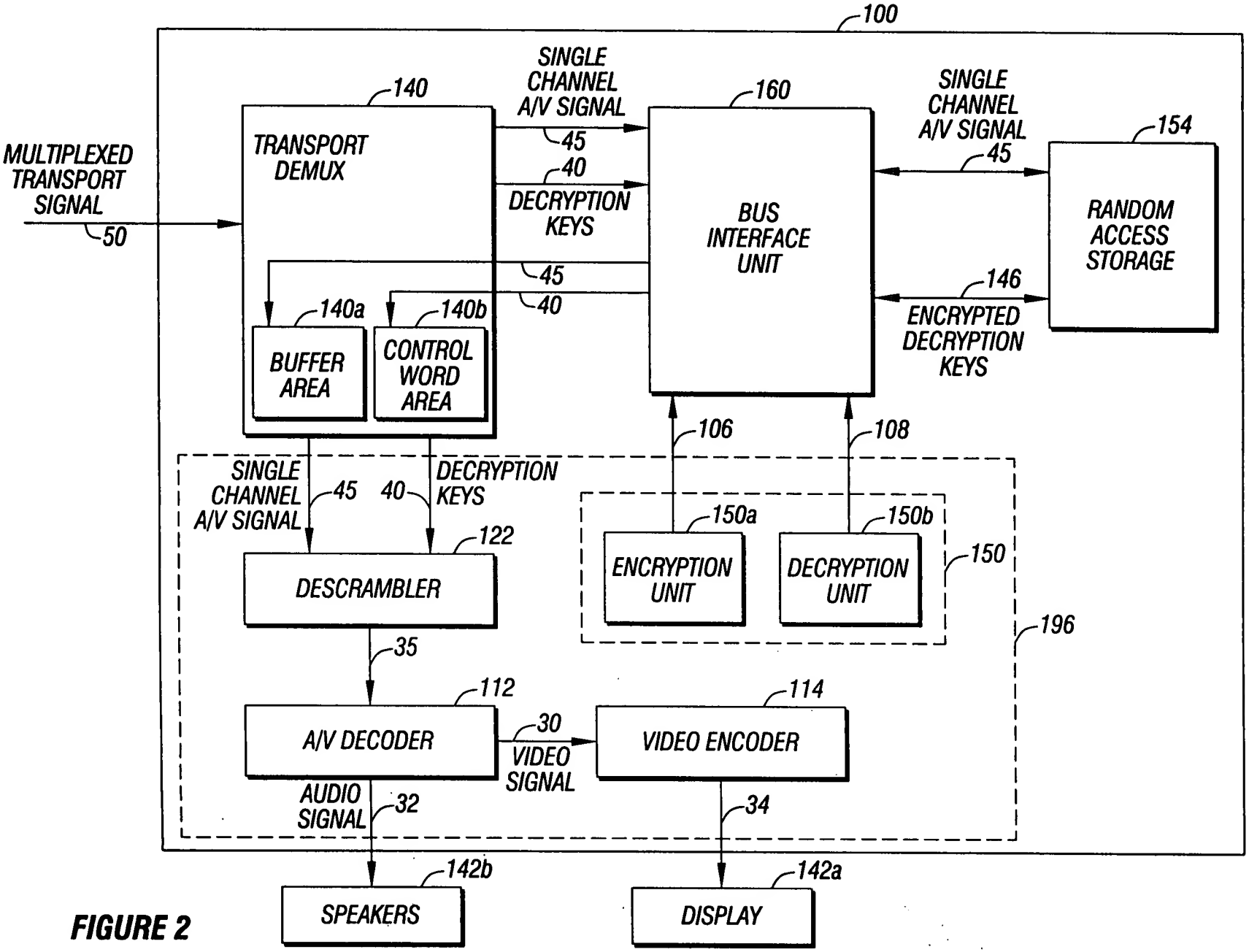
100
MULTIPLEXED TRANSPORT SIGNAL
50
140
TRANSPORT DEMUX
SINGLE CHANNEL A/V SIGNAL
45
40
DECRYPTION KEYS
160
BUS INTERFACE UNIT
SINGLE CHANNEL A/V SIGNAL
45
154
RANDOM ACCESS STORAGE
146
ENCRYPTED DECRYPTION KEYS
140a
BUFFER AREA
140b
CONTROL WORD AREA
106
108
SINGLE CHANNEL A/V SIGNAL
DECRYPTION KEYS
122
DESCRAMBLER
150a
ENCRYPTION UNIT
150b
DECRYPTION UNIT
150
196
35
112
A/V DECODER
30
VIDEO SIGNAL
114
VIDEO ENCODER
AUDIO SIGNAL
32
34
142b
SPEAKERS
142a
DISPLAY

FIGURE 2

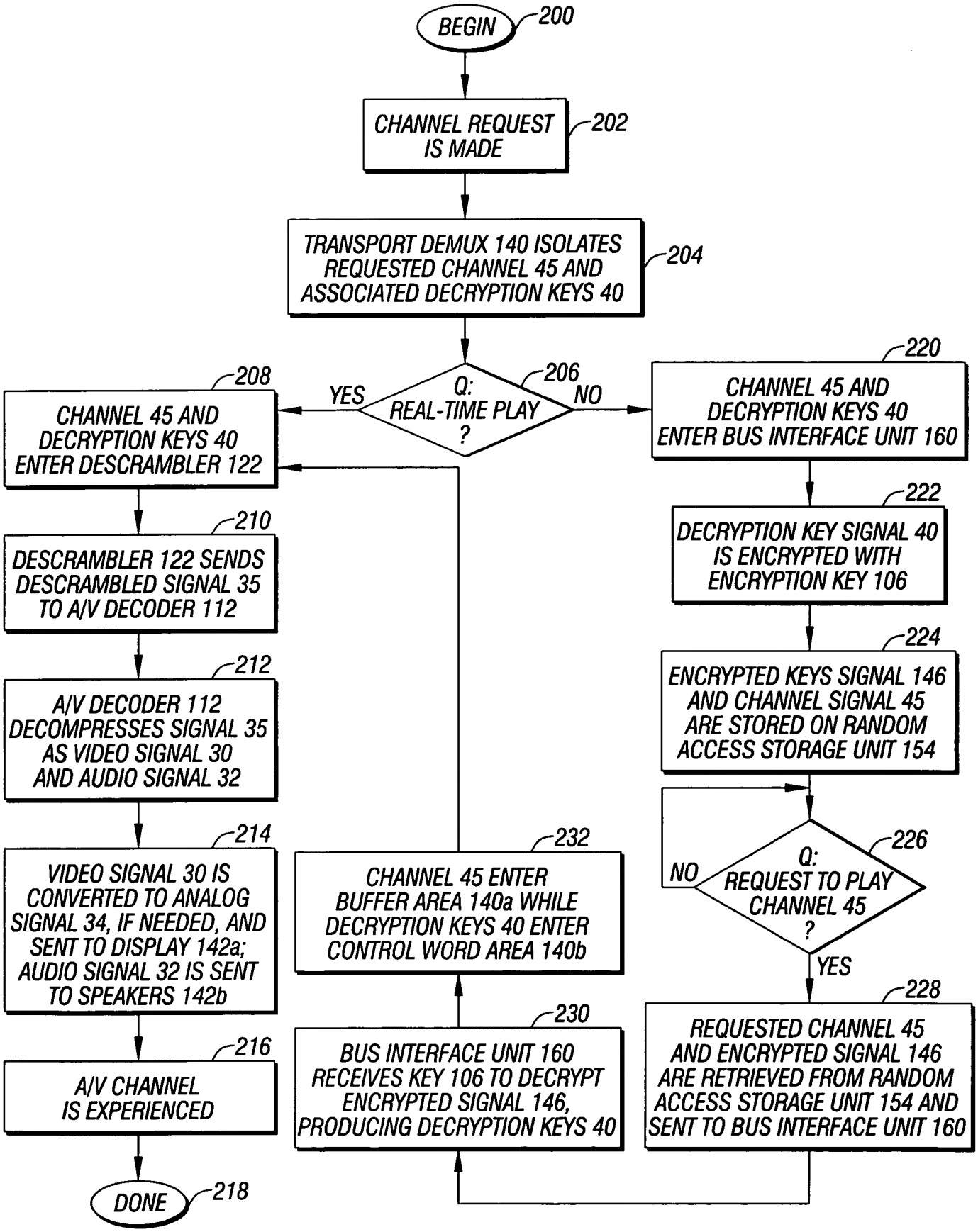
BEGIN
200
CHANNEL REQUEST IS MADE
202
TRANSPORT DEMUX 140 ISOLATES REQUESTED CHANNEL 45 AND ASSOCIATED DECRYPTION KEYS 40
204
Q: REAL-TIME PLAY ?
206
YES
NO
208
CHANNEL 45 AND DECRYPTION KEYS 40 ENTER DESCRAMBLER 122
210
DESCRAMBLER 122 SENDS DESCRAMBLED SIGNAL 35 TO A/V DECODER 112
212
A/V DECODER 112 DECOMPRESSES SIGNAL 35 AS VIDEO SIGNAL 30 AND AUDIO SIGNAL 32
214
VIDEO SIGNAL 30 IS CONVERTED TO ANALOG SIGNAL 34, IF NEEDED, AND SENT TO DISPLAY 142a; AUDIO SIGNAL 32 IS SENT TO SPEAKERS 142b
216
A/V CHANNEL IS EXPERIENCED
DONE
218
220
CHANNEL 45 AND DECRYPTION KEYS 40 ENTER BUS INTERFACE UNIT 160
222
DECRYPTION KEY SIGNAL 40 IS ENCRYPTED WITH ENCRYPTION KEY 106
224
ENCRYPTED KEYS SIGNAL 146 AND CHANNEL SIGNAL 45 ARE STORED ON RANDOM ACCESS STORAGE UNIT 154
Q: REQUEST TO PLAY CHANNEL 45 ?
226
NO
YES
228
REQUESTED CHANNEL 45 AND ENCRYPTED SIGNAL 146 ARE RETRIEVED FROM RANDOM ACCESS STORAGE UNIT 154 AND SENT TO BUS INTERFACE UNIT 160
230
BUS INTERFACE UNIT 160 RECEIVES KEY 106 TO DECRYPT ENCRYPTED SIGNAL 146, PRODUCING DECRYPTION KEYS 40
232
CHANNEL 45 ENTER BUFFER AREA 140a WHILE DECRYPTION KEYS 40 ENTER CONTROL WORD AREA 140b

FIGURE 3

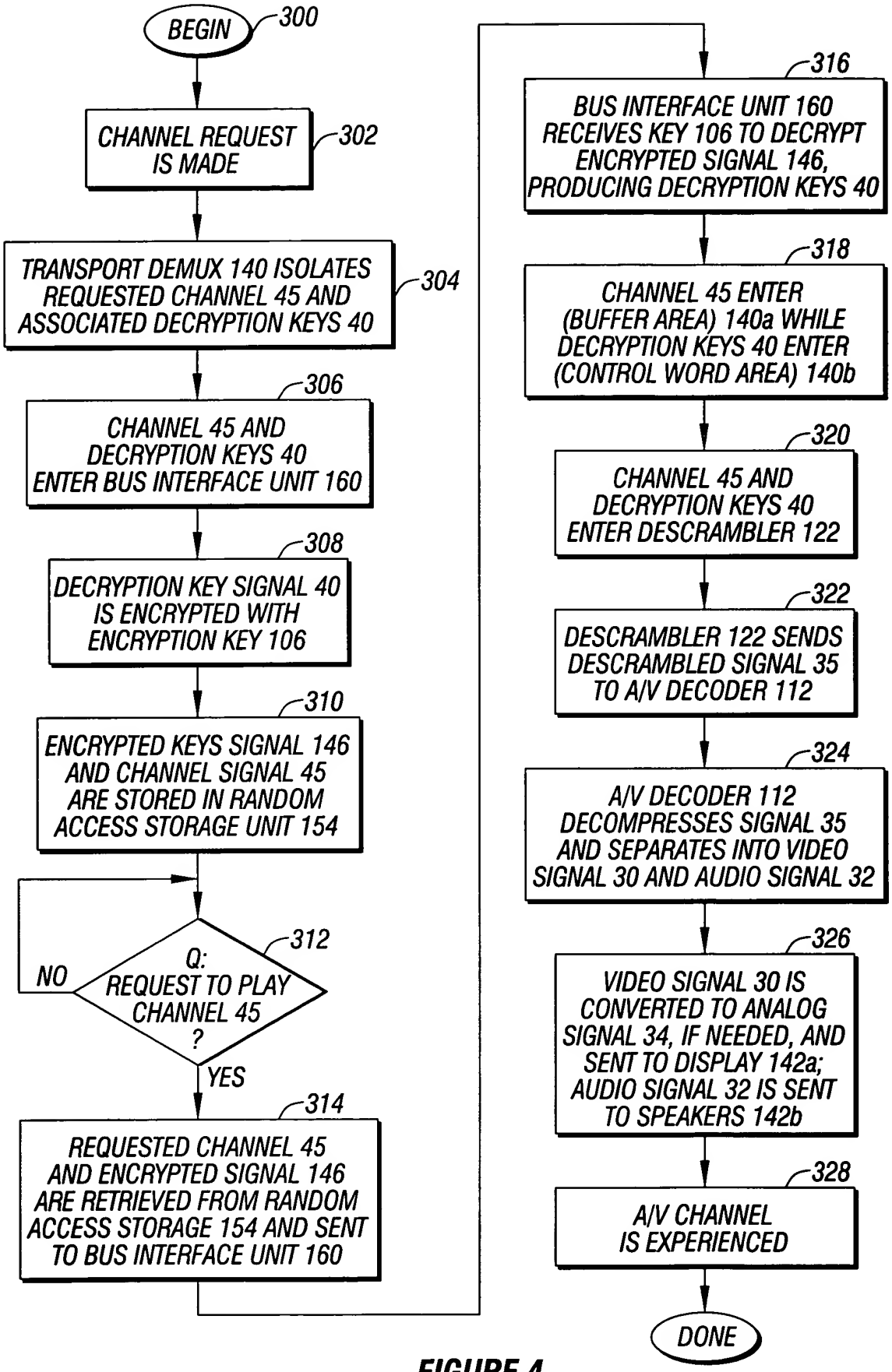
BEGIN
300
CHANNEL REQUEST IS MADE
302
TRANSPORT DEMUX 140 ISOLATES REQUESTED CHANNEL 45 AND ASSOCIATED DECRYPTION KEYS 40
304
CHANNEL 45 AND DECRYPTION KEYS 40 ENTER BUS INTERFACE UNIT 160
306
DECRYPTION KEY SIGNAL 40 IS ENCRYPTED WITH ENCRYPTION KEY 106
308
ENCRYPTED KEYS SIGNAL 146 AND CHANNEL SIGNAL 45 ARE STORED IN RANDOM ACCESS STORAGE UNIT 154
310
Q: REQUEST TO PLAY CHANNEL 45 ?
312
NO
YES
REQUESTED CHANNEL 45 AND ENCRYPTED SIGNAL 146 ARE RETRIEVED FROM RANDOM ACCESS STORAGE 154 AND SENT TO BUS INTERFACE UNIT 160
314
BUS INTERFACE UNIT 160 RECEIVES KEY 106 TO DECRYPT ENCRYPTED SIGNAL 146, PRODUCING DECRYPTION KEYS 40
316
CHANNEL 45 ENTER (BUFFER AREA) 140a WHILE DECRYPTION KEYS 40 ENTER (CONTROL WORD AREA) 140b
318
CHANNEL 45 AND DECRYPTION KEYS 40 ENTER DESCRAMBLER 122
320
DESCRAMBLER 122 SENDS DESCRAMBLED SIGNAL 35 TO A/V DECODER 112
322
A/V DECODER 112 DECOMPRESSES SIGNAL 35 AND SEPARATES INTO VIDEO SIGNAL 30 AND AUDIO SIGNAL 32
324
VIDEO SIGNAL 30 IS CONVERTED TO ANALOG SIGNAL 34, IF NEEDED, AND SENT TO DISPLAY 142a; AUDIO SIGNAL 32 IS SENT TO SPEAKERS 142b
326
A/V CHANNEL IS EXPERIENCED
328
DONE

FIGURE 4

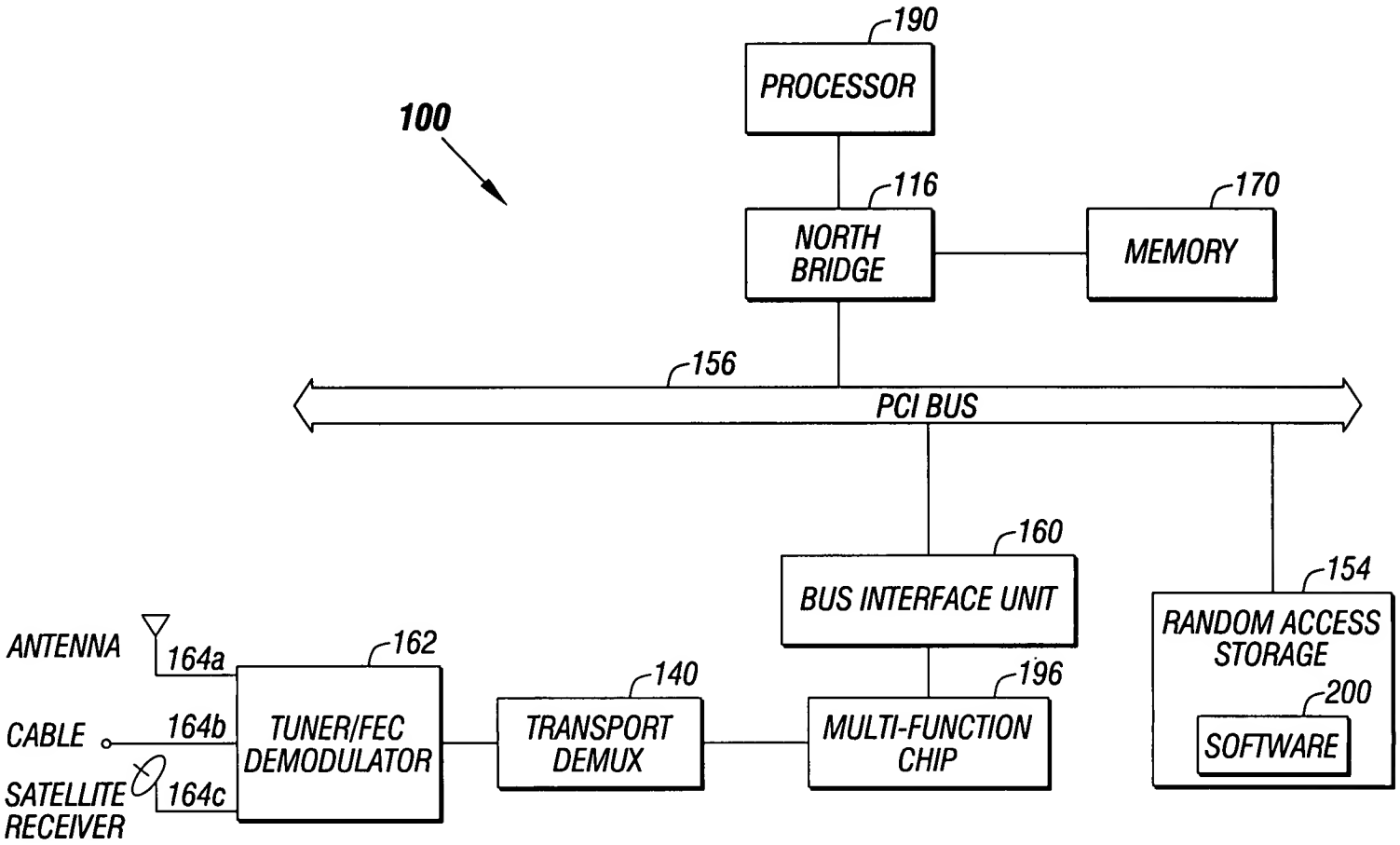
100
190
PROCESSOR
116
NORTH BRIDGE
170
MEMORY
156
PCI BUS
160
BUS INTERFACE UNIT
154
RANDOM ACCESS STORAGE
200
SOFTWARE
196
MULTI-FUNCTION CHIP
140
TRANSPORT DEMUX
162
TUNER/FEC DEMODULATOR
ANTENNA
164a
CABLE
164b
SATELLITE
164c
RECEIVER

FIGURE 5